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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BETZ, BLAKE E	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,810	FUNAKUBO ET AL.	
	Examiner	Art Unit	
	Blake E. Betz	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-84 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-84 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/112,151, filed on 07/09/1998.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 – 20 and 57 – 62 are rejected under 35 U.S.C. 112, second paragraph, as being confusing and contradictory to limitations specified in parent claims. Claims 15, 16, 57, and 58 all claim a means "for performing said second processing by generating the intensity value by progressively increasing the intensity value at an absolute value of said decreasing rate in a range..." Parent claims 11, 12, 53, and 54 claim a decreasing intensity rate from the inside to the outside intersection of the second pair of intersections and do not include increasing the intensity value from the inside intersection to the outside intersection of the second pair of intersections; "...and a decreasing rate at which the intensity value decreases from the inside intersection to the outside intersection of said second pair..."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5, 6, 9, 10, 11, 12, 23, 24, 43, 44, 47, 48, 51, 52, 53, 54, 65, and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,392,385 to Evangelisti et al. in view of U.S. Patent No. 6,005,580 to Donovan.

Claims 1, 9, 10, 11, 23, 24, 43, 51, 52, 53, 65, and 66 are taught by Evangelisti et al. Evangelisti et al. discloses an invention that draws a polygon using an anti-aliasing method that includes an edge-calculating device. Evangelisti teaches of surrounding a triangle with a beveled edge and performing anti-aliasing on the beveled edge using increasing and decreasing intensity values such that the intensity value increases from the outside to the inside of the beveled edge and decreases from the inside to the outside of the beveled edge. Figure 4 shows an example of a triangle with the beveled edge surrounding it. Column 8, lines 65 – 68, and column 9, lines 1 – 39, describe calculating the intensity value to be given to each portion of the polygon based on the location of the portion being either totally inside or outside the triangle or lying on an edge of the triangle. Additionally, the example on line 36 of column 9 shows that a portion inside the triangle receives an anti-aliasing factor of 1. Column 15, lines 65 – 68, and column 16, lines 1 – 7, state, "As one further note to the procedure of FIG. 17, as stated previously, the anti-aliasing factor (a) may be a 1, a 0, or a fraction, the new color is a new (n) computed shaded value, the old (o) value in the frame buffer or a fraction of each. If (a) is a 1, the new pixel value for the pixel just computed is placed unaltered in the frame buffer, if it is a 0, it is known that the pixel is outside the triangle

and the old value in the frame buffer will be left unaltered; or finally if (a) is a fraction, this fraction is used to accomplish the anti-aliasing in accordance with the procedure shown in the figure." Therefore, any portion lying within the triangle being drawn will receive an anti-aliasing factor of 1, which causes the intensity rate to remain constant inside the triangle. The invention of Evangelisti also includes performing the anti-aliasing processing by a parallel algorithm such that the anti-aliasing for a particular block of pixels is broken down for parallel execution. Column 4, lines 20 – 32, states, "The objects of the present invention may be accomplished by an SIMD computer architecture utilized in conjunction with a host processor and coordinate processor to render quality, anti-aliased, shaded color images into the frame buffer of a video display system. The method includes a parallel algorithm for rendering an important graphic primitive for accomplishing the production of a smoothly shaded color three-dimensional triangle with anti-aliased edges for display on a two-dimensional display screen. By taking advantage of the SIMD architecture and said parallel algorithm, the very time-consuming computations are broken down for parallel execution." Thus, the processing for calculating changes in the intensity value from the outside portion of the anti-aliasing area to the inside portion of the area and from the inside area to the outside area are performed in parallel with each other. Figure 6 shows an apparatus of the invention of Evangelisti including memory storage medium and a host and coordinate processor for performing calculating functions. Evangelisti does not, however, disclose deriving line intersection data associated with an intersecting portion between each edge of the polygon to be drawn and each scan line and sequentially calculating the intensity value

to be given to each portion of the polygon in the scanning direction with respect to said each scan line. The invention of Donovan includes a raster display and determining a line intersection between an edge of the polygon and a scan line. Figures 4A – 4D illustrate the intersection between an edge and a scan line. Column 7, lines 14 – 23, states, "As shown in step 310, a set of intersection points (x,y) is identified for each polygon edge in the set of polygon edges selected in step 300. Each set of intersection points identifies the intersection of the corresponding polygon edge with the horizontal and vertical scan lines in the output image. The notation (x,y) is used to refer to the coordinate space for an image to be displayed on a computer screen. Since texture maps reside in their own coordinate space, the notation (u,v) is used to refer to the texture coordinate space of a texture map." It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Evangelisti to include a raster output device as in Donovan. One would have been motivated to make such a modification to Evangelisti such that the output display as shown in figure 6 may also include older output displays such as a raster output display. It would have further been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Evangelisti to include deriving line intersection data associated with an intersecting portion between an edge of the polygon to be drawn and each scan line as in Donovan. One would have been motivated to make such a modification to Evangelisti so that each set of intersection points identifies the intersection of the corresponding polygon edge with the horizontal and vertical scan lines in the output image as stated by Donovan in column 7, lines 17 –

19. Additionally, if the intersection does not exist at a pixel point then processing may be performed to determine which pixel is considered to contain the intersection point as described by Donovan in column 10, lines 12 – 16. Column 7, lines 15 – 43, of Donovan describes the method for sequentially performing calculating intersection points between a polygon edge and a scan line then performing anti-aliasing functions by a filtering operation. Lines 44 – 47 state, "While the invention is described herein as a series of steps (see FIGS. 2-3 and 5-6), the invention is not limited to serially performing these steps. For example, many of these steps could be performed in parallel." Thus, Donovan teaches that the anti-aliasing processing steps may be performed sequentially or in parallel with each other. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti to include sequentially calculating the intensity value to be given to each portion of the polygon in the scanning direction with respect to each scan line. One would have been motivated to make such a modification to the invention of Evangelisti so that the process of Evangelisti can be performed on raster type devices where anti-aliasing is performed in accordance with each scan line in the scanning direction.

Evangelisti et al. and Donovan as applied to claims 1, 11, 43, and 53 teach of the apparatus of claims 2, 12, 44, and 54, respectively, except wherein the edge calculating device comprises means for calculating a first and second pair of positions on lattice points of displayed grid boxes that are located adjacent to a pair of real intersections between each scan line and an edge of a polygon. Evangelisti et al. as modified by

Donovan teaches of surrounding a triangle with a bevel region on a raster device. The scan lines of the device intersect the bevel region, thus producing a pair of inside and outside intersection points for every instance the scan line crosses the bevel region. Figures 4A and 4B of Donovan show a polygon edge intersecting a scan line. Column 8, lines 40 – 51, describe calculating a pair of positions on lattice points that are located adjacent to a pair of real intersection positions between a scan line and a polygon edge. "Since the intersection point (x,y) 412 is on the horizontal scan line 400, the value of y is integral. In contrast, x falls between the integral points 402 and 404. Thus, x has an integral part (x.sub.i) and a fractional part (x.sub.f). FIG. 4a also illustrates that the value of X.sub.f is the distance between the intersection point (x,y) 412 and the integral point 402. The value of x.sub.f can be calculated using the floor function (represented by the notation ".left brkt-bot. .right brkt-bot.") The floor function removes the fractional part of a floating point number (e.g., .left brkt-bot.1.7.right brkt-bot.=1). Thus, the value of X.sub.f can be calculated by the equation x-.left brkt-bot.x.right brkt-bot.. In addition, the integral point 402 is at coordinate point (x.sub.i,y.sub.i), where x.sub.i =.left brkt-bot.x.right brkt-bot. and y.sub.i =y." It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti in view of Donovan to include calculating a first and second pair of positions on lattice points of displayed grid boxes that are located adjacent to a pair of real intersections between each scan line and an edge of a polygon. One would have been motivated to make such a modification to the apparatus of Evangelisti so that upon performing anti-aliasing on the bevel region surrounding the triangle, the region

boundaries will be defined by pixel locations where intensity values may be assigned to the pixels without further anti-aliasing instead of at fractional pixel locations where further anti-aliasing may be required to display calculated intensity values. Column 9, lines 1 – 38, of Evangelisti describes calculating a first initial intensity value for points on the outside edge of the bevel, the first intersection pair, and an initial intensity value for points on the inside edge of the bevel, the second intersection pair.

Evangelisti et al. and Donovan as applied to claims 2, 12, 44, and 54 teach of the apparatus of claims 5, 6, 47, and 48, respectively. Column 9, lines 1 – 38, of Evangelisti describes generating an intensity level according to a bevel region surrounding a triangle. Following the scanning direction of a raster device, the intensity level of the bevel region from the outside to the inside of the region, for the first intersection pairs, progressively increases from a zero value outside the bevel, a fractional value between zero and one inside the bevel, and a value of one inside the bevel. Once inside the triangle, the intensity value remains constant until reaching the second intersection pairs lying on the bevel region downstream in the scanning direction from the first intersection pairs. The intensity level then progressively decreases from a value of one inside the triangle to a fractional value within the bevel to a value of zero outside the bevel area.

Claims 3, 4, 13, 14, 45, 46, 55, and 56 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,392,385 to Evangelisti et al. in view of U.S. Patent No. 6,005,580 to Donovan as applied to claims 1, 2, 11, 12, 43, 44, 53, and 54 above, respectively, and further in view of U.S. Patent No. 5,287,438 to Kelleher.

Evangelisti et al. and Donovan as applied to claims 1, 2, 11, 12, 43, 44, 53, and 54 teach of the apparatus of claims 3, 4, 13, 14, 45, 46, 55, and 56, respectively, except wherein said edge calculating device calculates said first pair of outside intersection and inside intersection and said second pair of outside intersection and inside intersection, based on trajectories obtained by dragging a diamond-like block between vertices of the polygon to be drawn, said diamond-like block having vertical and horizontal dimensions each corresponding to an interval of a display grid. Kelleher discloses a system and method for drawing anti-aliased polygons. Column 6, lines 5 – 20 of Kelleher, teaches of using a 4 X 4 pixel array to determine whether pixels lie either inside or outside a half-space. Kelleher also teaches that to evaluate a region larger than 4 X 4, the pixel array is dragged over the region, tiling it completely. Thus, the square 4 X 4 pixel array corresponds to a diamond-like block having vertical and horizontal dimensions each corresponding to an interval of a display grid. Additionally, Kelleher teaches that the pixel array may be dragged around a region. Therefore, it would have been obvious to drag the pixel array around the edge of a polygon to create the beveled region in Evangelisti et al. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti et al. and Donovan to include the 4 X 4 pixel array of Kelleher. One would have been motivated to make such a modification so that the beveled region of Evangelisti could be created in a fast and efficient manner with a predefined width determined by the pixel array size.

Claims 7, 8, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,392,385 to Evangelisti et al. in view of U.S. Patent

No. 6,005,580 to Donovan as applied to claims 5, 6, 47, and 48 above, respectively, and further in view of U.S. Patent No. 5,278,949 to Thayer.

Evangelisti et al. and Donovan as applied to claims 5, 6, 47, and 48 teach of the apparatus of claims 7, 8, 49, and 50, respectively, except wherein said increasing rate is determined based on a slope of the edge on the upstream side as viewed in the scanning direction, and said decreasing rate is determined based on a slope of the edge on the downstream side as viewed in the scanning direction. Thayer discloses an invention where a polygon renderer determines the coordinates of polygon edges to sub-pixel resolution in the x,y, and z coordinate directions. Column 9, lines 54 – 59 of Thayer, describes anti-aliasing vectors based on their slopes. "If desired, vectors may be anti-aliased via a transparency filter (not shown) which is stored in a color-lookup table ROM in the X stepper. Such a color lookup table may be indexed by the slope of the line in the intersection of each step of the line with the minor axis." Thus, the anti-aliasing is based on the slope of the vectors. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti and Donovan to include determining the increasing and decreasing intensity rates based on a slope of the edge of the triangle as in Thayer. One would have been motivated to make such a modification to Evangelisti and Donovan so that the intensity rate for the upstream and downstream side bevel regions can be computed quickly and efficiently with only the vertices of the triangle needed.

Claims 21, 22, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,392,385 to Evangelisti et al. in view of U.S. Patent

No. 6,005,580 to Donovan as applied to claims 11, 12, 53, and 54 above, respectively, and further in view of U.S. Patent No. 5,841,439 to Pose et al.

Evangelisti et al. and Donovan as applied to claims 11, 12, 53, and 54 teach of the apparatus of claims 21, 22, 63, and 64 except wherein, "when a vertex other than vertices at upper and lower ends of the polygon is located between two adjacent scan lines, said scan processing device separately performs processing based on a first distance from the upper one of the two adjacent scan lines to said vertex, and performs processing based on a second distance from the lower one of the two adjacent scan lines to said vertex, and calculates the intensity value by combining results of said processing based on said first distance and said processing based on said second distance." Pose et al. teaches of an invention that includes a linear interpolation filter for anti-aliasing intersection points not aligned with any one individual pixel from a display memory. Column 33, lines 40 – 50, states, "As can be seen from the drawing, the intersection point 200 is not aligned precisely with any one individual pixel from the encapsulating surface display memory, but is disposed between four adjacent pixels 202, 204, 206 and 208 (pixel 1, pixel 2, pixel 3 and pixel 4). The linear interpolation filter used herein for anti-aliasing in effect takes a weighted average of the color intensities of the adjacent pixels 202, 204, 206 and 208 on the basis of the distance from the intersection point 200 to each of the adjacent display memory pixels." When using a raster display device, an intersection point that is not aligned precisely with any one individual pixel is thus located between two adjacent scan lines. Pose discloses that processing is based on a weighted average of the distances from

adjacent pixels to the intersection. Thus, it would have been obvious to use only the distances between the intersection and the two adjacent scan lines to base a weighted average for pixel processing. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelist and Donovan to include anti-aliasing processing for a point or vertex point based on a weighted average of the distances from the point location and two adjacent scan lines if the point lies between two scan lines as in Pose. One would have been motivated to make such a modification to the invention of Evangelisti and Donovan in view of Pose so that additional methods of anti-aliasing for points not lying directly on scan lines are available for aesthetically smoothing a polygon edge.

Claims 25 – 42 and 67 – 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,392,385 to Evangelisti et al. in view of U.S. Patent No. 6,005,580 to Donovan, as applied to claims 1, 11, 43, and 53, and Japanese Laid-open Patent Publication (Kokai) No. 07-105390 to Ikumi et al.

Evangelisti et al. and Donovan as applied to claims 1, 11, 43, and 53 teach of the invention of claims 25, 28, 37, 67, 70, and 79 except wherein a polygon is drawn by combining a plurality of triangles and a control bit indicates whether each edge of each of the triangles is to be drawn. The invention of Ikumi discloses a polygon drawing method that divides a polygon into a plurality of triangles so as to draw the polygon. Ikumi includes an identification flag that indicates whether an outside line corresponding to a pair of adjacent coordinates of vertices is a border line or a division line, and drawing only outside lines corresponding to ones of the coordinates of vertices that are

indicated by the identification flag to correspond to the border lines. It would have been obvious to one having ordinary skill in the art the time the invention was made to modify the invention of Evangelisti and Donovan to include drawing a polygon by combining a plurality of triangles. One would have been motivated to make such a modification to the invention of Evangelisti so that the drawing of a complex polygon shape can be done using a conglomeration of simple triangle shapes. It would have also been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti and Donovan to include a control bit to determine whether or not to draw an edge of a triangle. One would have been motivated to make such a modification to the invention of Evangelisti and Donovan so that upon drawing a triangle wherein one of the edges does not need to be drawn, resources and time are saved by not drawing the edge. Additionally, an intensity value for an edge of a triangle can be determined by the control bit in that if there is no edge to be drawn then the edge can be assumed to have no intensity value.

Evangelisti et al. and Donovan as applied to claims 1, 11, 43, and 53 teach of the invention of claims 26, 29, 35, 38, 68, 71, 77, and 80 except wherein a polygon is drawn by combining a plurality of triangles and a control bit indicates whether intensity processing is to be performed on each edge of each of the triangles. The invention of Ikumi discloses a polygon drawing method that divides a polygon into a plurality of triangles so as to draw the polygon. It would have been obvious to one having ordinary skill in the art the time the invention was made to modify the invention of Evangelisti and Donovan to include drawing a polygon by combining a plurality of triangles. One would

have been motivated to make such a modification to the invention of Evangelisti so that the drawing of a complex polygon shape can be done using a conglomeration of simple triangle shapes. The invention of Donovan teaches of using a control flag to identify which polygon edges should be anti-aliased. Column 7, lines 3 – 9 of Donovan, states, "As another example, the processor 105, executing the graphics application 135, could provide to the graphics card 125 both data describing the set of polygons representing the image and data describing/identifying which polygon edges are to be antialiased in step 210 (e.g., flags could be stored in the data identifying which polygon edges should be antialiased)." It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti et al. and Donovan to include a control flag to identify which edges of the triangles should be anti-aliased. One would have been motivated to make such a modification to Evangelisti and Donovan so that system time and resources are saved by not performing intensity operations, anti-aliasing, on an edge of a triangle when it is not preferred.

Evangelisti et al. and Donovan as applied to claims 1, 11, 43, and 53 teach of the invention of claims 27, 30, 36, 39, 42, 69, 72, 78, 81, and 84 except wherein a polygon is drawn by combining a plurality of triangles and a first and a second control bit indicates whether each edge of each of the triangles is to be drawn and whether intensity processing is to be performed on each edge of each of the triangles, respectively. The invention of Ikumi discloses a polygon drawing method that divides a polygon into a plurality of triangles so as to draw the polygon. Ikumi includes an identification flag that indicates whether an outside line corresponding to a pair of

adjacent coordinates of vertices is a border line or a division line, and drawing only outside lines corresponding to ones of the coordinates of vertices that are indicated by the identification flag to correspond to the border lines. It would have been obvious to one having ordinary skill in the art the time the invention was made to modify the invention of Evangelisti and Donovan to include drawing a polygon by combining a plurality of triangles. One would have been motivated to make such a modification to the invention of Evangelisti so that the drawing of a complex polygon shape can be done using a conglomeration of simple triangle shapes. It would have also been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti and Donovan to include a control bit to determine whether or not to draw an edge of a triangle. One would have been motivated to make such a modification to the invention of Evangelisti and Donovan so that upon drawing a triangle wherein one of the edges does not need to be drawn, resources and time are saved by not drawing the edge. Additionally, an intensity value for an edge of a triangle can be determined by the control bit in that if there is no edge to be drawn then the edge can be assumed to have no intensity value. The invention of Donovan teaches of using a control flag to identify which polygon edges should be anti-aliased. Column 7, lines 3 – 9 of Donovan, states, "As another example, the processor 105, executing the graphics application 135, could provide to the graphics card 125 both data describing the set of polygons representing the image and data describing/identifying which polygon edges are to be antialiased in step 210 (e.g., flags could be stored in the data identifying which polygon edges should be antialiased)." It

would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Evangelisti et al. and Donovan to include a control flag to identify which edges of the triangles should be anti-aliased. One would have been motivated to make such a modification to Evangelisti and Donovan so that system time and resources are saved by not performing intensity operations, anti-aliasing, on an edge of a triangle when it is not preferred.

Evangelisti et al. and Donovan as applied to claims 28, 29, 30, 70, 71, and 72 teach of the invention of claims 31, 32, 33, 34, 40, 41, 73, 74, 75, 76, 82, and 83. Figure 17 of Evangelisti shows the computation of new pixel values with regard to an anti-aliasing factor, intensity value. The new pixel values are determined by a ration of an intensity value of a pixel that is to be drawn to an intensity value of a pixel that is originally located at the position where the pixel to be drawn exists. Evangelisti in view of Donovan includes a control bit to indicate whether an edge of a triangle is to be drawn or not. Evangelisti teaches that a point lying outside the bevel region and the triangle will have an anti-aliasing factor of 0. If an edge of a triangle is not to be drawn then that edge is considered to be outside the triangle region. Thus, when the control bit indicated that an edge of a triangle is not to be drawn, the intensity value of the pixel to be drawn is set to 0. Also, it is obvious to one having ordinary skill in the art that it is merely a matter of design choice to set the intensity value of a pixel to either a 0 or a 1 when an edge containing the pixel is not to be drawn or will not have intensity processing performed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 4,873,515 to Dickson et al.

U.S. Patent No. 5,325,474 to Kumazaki et al.

U.S. Patent No. 5,461,703 to Goyins et al.

U.S. Patent No. 5,668,940 to Steiner et al.

U.S. Patent No. 5,673,379 to Diehl

U.S. Patent No. 5,684,941 to Dye

U.S. Patent No. 5,872,902 to Kuchkuda et al.

U.S. Patent No. 5,903,279 to Lee et al.

U.S. Patent No. 6,329,977 to McNamara et al.

U.S. Patent No. 6,791,547 to Thrasher

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blake E. Betz whose telephone number is (703) 605-4584. The examiner can normally be reached on 7:30 - 4:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BB

BB 1/21/05

RICHARD HJERPE 1/24/05
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600